

Role of Botanical Gardens in the Humid Tropics and UNESCO's Programme related to them

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LUXURIANT VEGETATION is a prominent feature of the humid tropical regions and yet very little of it is known. The nature of the plants making up this vegetation, methods of propagation, growth requirements, potential use for the benefit of man—timber, products, barks—have not been studied systematically so far. This handicaps planning and development of agriculture and forestry, important contributors to the economy of a tropical country.

The little information available at present has chiefly come from botanic gardens maintained by departments of agriculture or scientific societies. There are at present only a small number of botanical gardens in the tropical regions. Some of them are:

- Botanic Gardens, Peradeniya, Ceylon
- Central National Botanic Garden, Calcutta
- National Botanic Gardens, Lucknow
- Botanic Gardens, Singapore
- Jardim botanico do Rio de Janeiro
- Botanic Gardens, George Town, British Guiana
- Royal Botanic Gardens, Hope, Kingston, Jamaica
- Botanic Gardens, Bogor, Indonesia.

The gardens are of different size and their activities include maintenance of a representative collection of the vegetation of a region, demonstration of principles of conservation of vegetation, maintenance of nurseries of plants, collection, preservation and exchange of dried plant specimens for purposes of identification. It is commonly acknowledged that much of the natural vegetation of the humid tropical regions is cut down or burnt unmethodically resulting in erosion of the soil and this results in subsequent damage by floods. The botanic gardens—the large ones with extensive enclosures—have a definite role here to play in demonstrating to the general public the useful role of vegetation in binding soil, thus preventing erosion and making them useful for agriculture. It may be added here that in the desert tropical regions,

where the advance of sand dunes threatens valuable agricultural land, demonstration of fixing the sand dunes by appropriate vegetation is a definite function of a botanical garden located in a desert tropical region.

Secondly the gardens can play a valuable role in breeding plants resistant to various types of plant diseases in nurseries and trial plots and then distributing such varieties to agriculturists. It can and does help in introducing plants which thrive in similar environments in another region to its nursery for the first time and breeding one or more generations of them, thus making them adapted to their new surroundings. Further some plants are in danger of complete extinction from the surface of the earth owing to their inability to adapt to possible changes in the environments in which they grow. It would be valuable to protect them and to increase their numbers if possible, and the botanical gardens can play a vital role in this matter. Several botanic gardens undertake such projects and examples that come to the mind are the Medicinal Garden in Ganewatte in Ceylon, the Botanic Gardens of Hakgala and Gampaha, the Botanic Gardens in George Town, British Guiana, the Royal Botanic Gardens, Hope, Kingston, Jamaica.

Most of the botanic gardens maintain a herbarium wherein type specimens of plants are preserved for taxonomic studies. This material is annotated by competent botanists describing their chief characteristics, places from where they have been collected and their scientific names. In order to do this regular expeditions are undertaken to different areas to collect the plants. Several sets per species are collected and the specimens are suitably mounted on sheets of paper to preserve them. Identified duplicates of the specimens are exchanged with herbaria in other parts of the world. Preparation of floras of the region are undertaken utilizing the material preserved in such herbaria. The preparation of the flora of the Malaysian region is currently in progress and a large number of herbaria and taxonomists all over the world are co-operating in the project.

The humid tropics programme of UNESCO intends supporting the collection, identification, preservation and exchange of material in herbaria. Until now, material collected had to be sent abroad for identification purposes. This has naturally retarded the regular publication of the floras of tropical regions, important in knowing the features of the vegetation in the regions.

The first step is the organization of regular expeditions for collection purposes from a large number of selected institutions located in the humid tropical regions. In order to do so, a number of specialists have to be trained to undertake regular expeditions.

Relatively well-established institutions in the tropics would serve as key centres for organizing training programmes. UNESCO assistance would be utilized to finance this training programme, by provision of foreign specialists, equipment, etc. It would also bear the costs of publication of results.

UNESCO's Advisory Committee for Humid Tropics Research at its first session in Manaus (Brasil) in July 1957, recommended that the Secretariat study the practicability of establishing such key herbaria. Information from a large number of herbaria in the humid tropical regions was collected regarding the nature and total number of specimens, annual additions, sources of specimens, identifications carried out and exchange of specimens effected during the last three years. More than 100 institutions furnished this information, and it is hoped that a short list of suitable institutions for development as key herbaria will be established by the Advisory Committee.

Depending on the finances available, it is hoped to conclude agreements with these institutions to make arrangements for organizing training programmes.

Another form of UNESCO's activities in the field of Humid Tropics research in which we collaborate closely with the botanic gardens, is the convening of scientific symposia under the auspices of this UNESCO Office, e.g. the Symposium on the Study of Tropical Vegetation in Kandy, Ceylon, in March 1956, which was organized jointly by this UNESCO Office and its sister office in New Delhi; the Symposium on the Phytochemistry of Tropical Plants in Kuala Lumpur, Malaya, in December 1957, and the Symposium on the Vegetation of the Humid Tropics, held in Bogor, Indonesia, in December 1958.

It may also be mentioned that this UNESCO Office has on several occasions awarded grants to facilitate the exchange of research workers between botanical gardens and herbaria in the tropical regions.

It will be evident from the foregoing that UNESCO is deeply concerned with the development of botanic gardens. Their collaboration is indispensable for the implementation of the UNESCO programme in Humid Tropics research. The UNESCO Science Co-operation Office for South-east Asia is happy to express its appreciation of the scientific work done by the Singapore Botanic Gardens. We congratulate the Gardens on the Centenary and express our hope for fruitful collaboration in the future.